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Spillover and conflict in collective bargaining: evidence from a survey of Dutch union and firm negotiators

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Abstract

Using unique survey data on Dutch collective agreement negotiators, the authors model how information about other collective bargaining events influences the probability of negotiators encountering bargaining impasses or industrial action during collective bargaining. Competing hypotheses about this influence, derived from economic, social psychological and sociological approaches, are tested. The findings indicate that information about bargaining outcomes elsewhere has no significant effect on the occurrence of conflict. However, if the information content of spillover refers to the conflict potential in other bargaining events and the sources of information are proximate, the probability of conflict is increased. This suggests that sociological mechanisms offer a compelling alternative to those invoked in economics for explaining the relationship between spillover and conflict.

Keywords

collective bargaining, conflict, information, negotiators, spillover

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Introduction

This study investigates the impact of information spillover in collective bargaining, taking the perspective of individual negotiators. Empirical research indicates that spillovers about bargaining outcomes (e.g. wages) and conflicts (e.g. strikes) from past bargaining events and bargaining events in other firms influence the occurrence of conflict in current bargaining events. Several conflicting theoretical mechanisms for such spillover effects have been proposed. The central tenet of economic bargaining theory is that spillover affects negotiators when the information allows them to reduce uncertainty regarding critical but not fully known aspects of the bargain, consequently reducing conflict. Social psychologically inspired theories argue that spillovers are driven by social comparisons and increase the divergence of preferences at the bargaining table, thereby leading to more conflict. Moreover, sociological theories of diffusion stress the role of spillover as potentially increasing conflict.

Empirical studies on information spillover and conflict produce mixed and partially contradictory results (e.g. Babcock et al., 1996; Campolieti et al., 2005; Ingram et al., 1993; Kuhn and Gu, 1999; Schnell and Gramm, 1987; cf. Biggs, 2002, 2005; Conell and Cohn, 1995). Moreover, these studies suffer from two methodological drawbacks. First, with the exception of Babcock et al. (1996), the proposed mechanisms in these studies are not tested directly. Second, influence is inferred from observed correlations between different bargaining events, while such correlations could just as well be caused by unobserved variables affecting these bargaining events simultaneously (Manski, 1993; Mitchell, 1982).

Thus it remains unclear how conflict in one bargaining event is affected by other bargaining events. This study aims to shed new light on this relationship. Using information from Dutch collective agreement negotiators, it addresses the following research question: how and under what conditions does information about other bargaining events influence the probability of negotiators experiencing conflicts in collective bargaining?

Negotiator surveys have proved successful in wage determination studies but have rarely been used to analyse conflict in collective bargaining. Yet such an approach helps to overcome many limitations of official strike statistics (Franzosi, 1989) and provides important information about key actors determining collective agreements (Kaufman, 2002). In particular, the analysis of spillovers benefits considerably from the self-reports of negotiators, since they measure the influence of information about other bargaining events directly. For instance, Babcock et al. (1996) study the relationship between spillover and conflict using a survey of union and firm negotiators of teachers' salaries. However, they employ considerable *a priori* limitations on potential reference points (Manski, 1993; Mitchell, 1982) and types of information spillover.

This article moves beyond the analysis of a single profession and extends the range of potential reference points and types of spillover under analysis. To this end, a representative sample of Dutch collective agreements was compiled and the negotiators involved were surveyed. Spillover measurements distinguished between different information sources and different informational content of spillover. Moreover, the data recorded not only the occurrence of manifest conflicts such as strikes, but also bargaining impasses, thus uncovering conflicts that remain latent due to organizational and institutional

constraints, conflicts which are not taken into account in traditional strike statistics. This is important because the absence of manifest conflict (strikes) does not negate the existence of conflict (Dix et al., 2008; Hebdon, 2005) and impasses impose costs on employers and employees much like strikes do (Kaufman, 1981: 336–7).¹

Despite declining unionization, collective bargaining still prominently governs many aspects of working life, with an average of 62 per cent of all workers in OECD countries covered by a collective agreement (Visser, 2011). In addition, the global financial crisis and its aftermath once more made it clear that peaceful labour relations must never be taken for granted. Worsening employment relations have increased the risk of social unrest in the world's advanced economies (ILO, 2013) and prominent scholars argue that the 'long wave' of economic development is returning to a state that will lead to a revival of labour conflict (e.g. Kelly, 1998). The first studies asserting that strikes appear to be resurgent are now emerging (e.g. Brym et al., 2013), while up and coming economies like China face a rapidly increasing number of labour disputes (Cheng et al., 2012). In light of such trends, new insights into the long-standing puzzle of spillover and labour conflict hold particular importance.

Theory and hypotheses

Rational learning

The classic paradox that has driven the theoretical development of economic bargaining models of industrial conflict may be summarized as follows: conflicts in collective bargaining, both manifest ones such as strikes and latent ones such as impasses (see Kaufman, 1981), are costly to both employers and employees, so why do they not avoid these costs and settle on the eventual outcome immediately (Hicks, 1932)? The general argument in economic bargaining models is that bargaining behaviour is determined by negotiators' perceptions of aspects of the bargaining event that are critical to reaching an agreement but are not fully observable to all actors (Cramton and Tracy, 2003). These aspects are typically assumed to be bargaining power and the economic state of the firm (i.e. its profitability and consequently its ability to pay). Negotiators consequently face uncertainty because the true value of these factors is not fully observable (Shalev, 1980). To overcome this uncertainty, they use information that may reveal something about these factors. For instance, industrial relations and labour economics research consistently finds an association between business cycle indicators and strikes (e.g. Card, 1990; Cramton and Tracy, 2003; Franzosi, 1989; Kaufman, 2002). The question of how changes in these business cycle indicators influence strikes (Kaufman, 1981: 334) is generally, though often implicitly, answered by assuming that negotiators use them to overcome their uncertainty about bargaining power or the economic state of the firm.

Similarly to business cycle indicators, information about bargaining events in the past of a bargaining unit and in other bargaining units may be indicative of bargaining power and a firm's economic state (see Burgess, 1988). Hicks contends that 'the majority of [...] strikes are doubtless the result of faulty negotiation [...] Any means which enables either side to appreciate better the position of the other will make a settlement easier' (1932: 146–7). Considering that bargaining units exist for multiple contract terms, 'the

experience of striking offers the bargaining parties an opportunity to learn from their mistakes [...] Thus one would expect bargaining units that have experienced a stoppage to be less likely to strike during future contract negotiation' (Schnell and Gramm, 1987: 222). In other words, by using the information obtained from previous bargaining events, negotiators improve their knowledge, thereby decreasing the probability of costly mistakes such as strikes or impasses.

A similar reasoning lies at the heart of Kuhn and Gu's (1999) extension of asymmetric information models of strikes that incorporates spillover across bargaining units. Asymmetric information models became a common solution to the Hicks bargaining paradox in the 1980s and remain highly influential in strike research. These models generally assume that firms are better informed about their ability to pay than employees and their unions. Strikes force this information to be revealed. Firms will only take a strike if its anticipated costs are lower than the costs of giving in to union demands, i.e. they can use a strike to signal their limited ability to pay. Unions may use strikes as screening devices if they believe that firms are misrepresenting their true ability to pay. Kuhn and Gu (1999) argue that the economic state of different firms can be correlated, for instance when they are part of the same industry, due to shared changes in technology and product market conditions. Because outcomes and strikes reveal information about a firm's ability to pay wages, union negotiators in bargaining units that negotiate later may obtain useful information by observing outcomes and strikes in other bargaining units. By bringing union negotiators' perceptions of the firm's ability to pay closer in line with the firm's true ability to pay, spillover is assumed to decrease conflict.

These theories share three building blocks:

- 1) strikes are a result of rational action under incomplete information;
- 2) spillovers improve information (negotiators are implicitly assumed to be affected only by spillovers that serve this function (cf. Kuhn and Gu, 1999: 122)); and
- 3) improved information reduces conflict.

Improving your own information by observing others is referred to by Kuhn and Gu as 'learning'. As this mechanism is based on strong rationality assumptions, it will be referred to as 'rational learning' here and the following hypothesis is derived:

Hypothesis 1) The more a negotiator is influenced by information about other bargaining events, the *less* likely he or she is to experience conflict in collective bargaining.

Social comparisons

Tounadre and Villeval (2004) implemented an experimental test of Kuhn and Gu's sequential bargaining model and found only limited evidence for rational learning across bargaining units decreasing conflict, a finding they explain by the impact of fairness and equity considerations. Equity theory stresses that people compare themselves with similar others. Adams notes that '[t]he fairness of an exchange between employee and

employer is not usually perceived by the former purely and simply as an economic matter. There is an element of relative justice involved that supervenes economics and underlies perceptions of equity or inequity' (1963: 422). Therefore, workers will strive for wage rates comparable to those of workers in other companies performing similar tasks (see Akerlof and Yellen, 1990; Frank, 1984; Rees, 1993). Social comparisons of this type govern many decision making processes (Fehr and Falk, 2002) and empirical studies show that these social comparisons indeed play an important role in collective bargaining (Babcock et al., 1996, 2005). Besides comparisons with other workplaces, past wages are major determinants of employees' preferred wages (Bewley, 1999), turning both previous outcomes and outcomes elsewhere into potential reference points (see Tversky and Kahneman, 1991).

Contrary to rational learning, the social comparison mechanism does not assume that spillovers occur only when information is relevant to unobservable critical aspects of the bargaining event. Rather, the evaluation of relevance is guided by self-interest (Rees, 1993). Since firms and unions have opposing interests, these self-serving biases entail that spillovers will increase the divergence in their preferences, thereby leading to conflict. Social comparisons over time and between bargaining units thus lead to increased demands and conflicts. In contrast to hypothesis 1, this effect suggests the following competing hypothesis:

Hypothesis 2a) The more a negotiator is influenced by information about the outcomes of other bargaining events, the *more* likely he or she is to experience conflict in collective bargaining.

Rational learning revisited: the sociological perspective

Spillover is an example of social influence, which figures prominently in sociological theory. For instance, it is argued that facing uncertainty, organizations and their leaders mimic other organizations (DiMaggio and Powell, 1983; Fligstein, 1985). Such organizational learning theories (see Levitt and March, 1988) stress the importance of diffusion in organizational networks. Similarly, following Coleman et al. (1957), the decisions of individual actors are argued to be affected by their observation of the behaviour of others (see also Burt, 1987; Strang and Tuma, 1993). Highlighting the shortfalls of an atomized conception of actors (Granovetter, 1985), a number of theoretical models (e.g. Granovetter, 1978) have been developed sharing the core notion that an individual's propensity to initiate some action is positively affected by the number of others who have previously done so (Hedström and Swedberg, 1996). In a context of uncertainty, imitation is an *ex ante* rational strategy (Hedström, 1998), leading to the diffusion of behaviours.

Theories of diffusion have been applied to the analysis of societal conflict (e.g. McAdam, 1983), including strikes. Examining aggregate data on strikes in America, Chicago and Paris in the late 19th century, Biggs (2003, 2005) concludes that diffusion² plays an important role in strike waves. He proposes inspiration as a mechanism for diffusion between workplaces, as strikes elsewhere create occasions for deciding to strike (cf. Oliver, 1989) and raise the hope of favourable results, especially when the observed strike is successful. Analysing strikes in coal mines in French departments for the period

1890-1935, Conell and Cohn (1995) find that strikes, even unsuccessful ones, in one department increase the strike rate in other departments. They propose three mechanisms, as information about strikes in other workplaces may:

- 1) raise workers' awareness of their own grievances;
- 2) serve a date setting function; and
- 3) offer tactical guidance by signalling favourable conditions for strike action.

The difference between diffusion-based approaches in sociology and rational learning theories in economics is remarkable. Whereas the latter associate spillover with decreased conflict, the former stress its conflict increasing effects. This is especially noteworthy because both mechanisms are based on models of rational actors using information about events elsewhere to make decisions under uncertainty.

However, while spillover models in economics were developed for contexts of unionized workers and collective bargaining, sociological diffusion theories until now have only been considered for periods preceding the institutionalization and pacification of industrial relations (see Biggs, 2005: 1685). To apply these insights to spillover in contemporary collective bargaining, one must account for a number of crucial differences between the two contexts:

- 1) The locus of decision making has shifted from individual workers to trade union and employer representatives. Even though industrial action is still carried out by workers, conflicts now emanate from decisions made at the bargaining table.
- 2) Date setting and consciousness raising are unlikely to be significant mechanisms leading to spillovers between bargaining units nowadays (Conell and Cohn, 1995: 372).
- 3) Overt industrial conflict is much less frequent, limiting the number of observable events.
- 4) Collective bargaining occurs at fixed intervals, creating a series of related bargaining events. This means that it is no longer just spillover from other workplaces that may trigger conflict; information about the past bargaining events in the negotiators' own bargaining unit is likely to also be very influential.

To apply the lessons of diffusion models to contemporary collective bargaining, this study considers the effects of diffusion on negotiators. Negotiators are aware of what happens in other bargaining events through their personal and intra-organizational networks as well as through the public media. Furthermore, professional trade union and employers' negotiators are involved in many different bargaining events, offering first hand access to information about them. Because mobilizing potential, strike funds, public support and profits and bargaining power are often similar to bargaining events in the past and in other bargaining units, observing workers' (un)willingness to participate in industrial action and the success of conflicts provides valuable tactical guidance.

Conflicting interests are inherent to the distributive nature of collective bargaining. Yet escalation is costly and its outcomes uncertain. Negotiators only risk conflict when

they expect that the benefits will outweigh the costs. Information about other bargaining events is invaluable for such decisions. All else being equal, negotiators who make more use of information about conflict potential in other bargaining events experience less uncertainty and are therefore more likely to choose conflict over compromise. Against hypothesis 1, the following competing hypothesis is proposed:

Hypothesis 2b) The more a negotiator is influenced by information about the conflict potential in other bargaining events, the *more* likely he or she is to experience conflict in collective bargaining.

Differences between union and firm negotiators

Strict adherence to the asymmetric information model used by Kuhn and Gu (1999) would suggest that only union negotiators need to reduce uncertainty by learning from other bargaining events, as firm negotiators are assumed to possess perfect information about their ability to pay. Therefore, the use of information about other bargaining events by firm negotiators cannot reduce the probability of conflicts. Social comparisons are traditionally primarily associated with workers' rather than employers' perceptions of reference wages. Past diffusion models of industrial conflict considered that the conflict increasing effects of spillover affect workers rather than firm owners. In contemporary labour relations, in which wages are predominantly determined under collective bargaining, something similar may hold true, albeit it for different reasons. For trade unions, high demands and industrial action can be of substantial propagandistic value for attracting new members (Akkerman, 2008). Conflict potential in other bargaining events, regardless of its impact on the collective agreement, reveals important information about possible gains in membership from tough bargaining strategies. This implies that, particularly for union negotiators, these spillovers reduce uncertainty about the benefits of tough bargaining and may be sources of inspiration for imitative conflict. Hence whatever the direction of the effect of spillover on conflict, each theoretical approach suggests that this effect is stronger for unions than for firms, leading to the following interaction hypothesis:

Hypothesis 3) The association between the influence of information about other bargaining events and experiencing conflict in collective bargaining is stronger for union negotiators than for firm negotiators.

The empirical context

Collective bargaining in the Netherlands

The Dutch economy features a large service sector, its share of the GDP being 74 per cent, whereas manufacturing accounts for 23 per cent (EIRO, 2008). The Netherlands has traditionally been a polarized society, divided along religious, ideological and status lines. Dutch industrial relations still reflect these divides, with the three major trade union federations representing Christian-democratic, social-democratic and white-collar

interests (EIRO, 2008). Multi-unionism, where different trade unions are involved in the same bargaining event, is common in collective bargaining in the Netherlands (Akkerman, 2000, 2008). Trade union density had been declining in the past (Visser, 1992: 349) and is now relatively stable at approximately 24 per cent (EIRO, 2008). Collective agreement law requires that employers apply the collective agreement to all employees, regardless of their membership. The Ministry of Social Affairs and Employment usually extends sector level collective agreements, through which all employees in the sector are covered (Rojer, 2002). Consequently, collective bargaining coverage in the Netherlands is currently above 80 per cent (EIRO, 2008).

The Netherlands exhibits both sector and company level bargaining, with the sector level being dominant. There are approximately 1000 collective agreements, of which approximately 20 per cent are sector agreements. These may act as framework agreements to company level bargaining (EIRO, 2008), i.e. in some cases there is a mixture of both types of agreement.

The Dutch system may be typified as state-sponsored coordination (Traxler, 2003). Two important institutions coordinate labour relations at the national level. In the bi-partite Labour Foundation, peak organizations of trade unions and employer organizations meet. The Labour Foundation produces central agreements, which are not legally binding for the members of the peak organizations but carry significant weight as benchmarks for sector and firm level bargaining (Torenvlied and Akkerman, 2002, 2004). During semi-annual consultations with the government, the Labour Foundation negotiates over social economic issues, such as the preferred wage increase. In addition to the Labour Foundation, representatives of the three main trade union federations, the three main employer confederations and independent members appointed by the government meet in the Social Economic Council (SER). The SER consults and acts as an advisory council on all major social and economic issues (EIRO, 2008).

Industrial conflict in the Netherlands

Compared to most other European countries, there is little strike activity in the Netherlands. The official annual number of strikes between 2005 and 2011 varied between 17 and 31. Approximately half of these strikes were related to disputes in collective bargaining (CBS, 2012). The annual number of work days lost through industrial action varied substantially during this period, peaking at 120,600 in 2008 and dropping to as low as 4600 in 2009. Between 2005 and 2011, the number of workers involved in industrial action was also highest in 2008 (51,900) and lowest in 2009 (3600) (CBS, 2012). Industrial action is most prevalent in manufacturing and transport.

Conflicts in collective bargaining are usually resolved by the bargaining parties themselves and occasionally through a mediator. The right to strike is recognized through the recognition of the European Social Charter and extends to the public sector. Employers may resort to legal action to prevent strikes. Although no distinction is made between essential and non-essential services, third-party interest may be invoked as a restriction on the right to strike (EIRO, 2002; EUROFOUND, 2012). The number of court interventions in industrial action is relatively high (EIRO, 2002), suggesting substantial conflict

arising from collective bargaining that remains at least partially hidden from official strike statistics.

Data and measurements

Sample

Data from the 2011 Dutch Negotiator Survey (Lehr, 2011) were used. The initial sample for this survey consisted of negotiators involved in 125 company agreements and 42 sector agreements. 150 of these agreements were selected via a randomized procedure from the pool of the approximately 1000 collective agreements. An additional sample of 17 agreements was added to the random sample to ensure sufficient variation on the dependent variable. These agreements were selected on the basis of prior knowledge that there had been a bargaining impasse in the form of a union ultimatum. Data collection began in October 2011 and ended in January 2012. To limit the impact of potential retrospective bias, only agreements with starting dates from 1 January 2009 onwards were included. Moreover, to minimize the probability of collecting data on bargaining events that were still in progress, agreements with start dates after 1 April 2011 were excluded.

Through contacts with firms, trade unions and employer organization, as well as the extensive document analysis of (preliminary) contracts, official correspondence, communiqués and media coverage, 307 negotiators involved in the 167 collective agreements included in the sample were traced and invited by email to participate in an online survey. Five of the negotiators were involved in several of the collective agreements in the sample but were surveyed for just one.

The survey consisted of questions about: the negotiators' background characteristics; various types and sources of information affecting collective bargaining; and the characteristics of the collective bargaining event on the basis of which they were selected in the sample. Respondents were also asked to list the five most important other negotiators involved in their collective bargaining event. This strategy yielded 144 additional negotiators, who were subsequently invited to participate in the study. In total, 451 negotiators were invited, of whom 54.10 per cent were union negotiators and 45.90 per cent represented the interests of the firms. After two reminders, the non-responding negotiators were contacted by telephone. A total of 128 negotiators involved in 78 of the 167 selected collective agreements completed the questionnaire. The response rates were 31.96 per cent for union negotiators and 24.15 per cent for firm negotiators, common response rates for surveys of professional organization representatives. No significant non-response bias was found regarding the distribution of union and firm negotiators and sector and company agreements.

Measures

Dependent variable. Conflict in collective bargaining was measured by asking negotiators whether an impasse had occurred in their bargaining event and, if affirmed, whether any collective action was initiated by the workers and/or union(s) in the bargaining event. From these questions, an ordinal variable was created, with '0' for 'no conflict',

Table 1. Overview of measurements for the influence of information about other bargaining events.

In general during collective bargaining, I am influenced by information about...
Outcomes for the same collective agreement in the past
Outcomes for collective agreements in other companies in the same sector
Outcomes for collective agreements in other sectors
Past readiness for industrial action of the employees covered by the collective agreement
Readiness for industrial action of employees in other companies in the same sector
Readiness for industrial action of employees in other sectors
The success of industrial action for the same collective agreement in the past
The success of industrial action in other companies in the same sector
The success of industrial action in other sectors

‘1’ for ‘impasse, but no industrial action’ and ‘2’ for ‘industrial action’. If an impasse was reported, the respondents were asked what type of impasse and what were the substantive reasons for this impasse. An overview of the types of impasses and their reasons is reported in Appendix Tables A1 and A2. The Appendix is available via the *Work, Employment and Society* journal website.

Independent variables. Spillover may entail various types of informational content, each potentially differently associated with bargaining impasses. The statements used to measure spillover distinguished three types of informational content:³ information about outcomes; about employees’ readiness for industrial action; and about the success of industrial action. Besides informational content, sources of spillover may vary. Three potential sources were distinguished: first, the past of the negotiator’s own bargaining unit (prior contract periods); second, other companies within the same sector; and third, companies in other sectors. Respondents were asked to rate their agreement with nine statements about the influence of a particular type of information on their collective bargaining. These nine statements are shown in Table 1. Possible answers ranged from 1 (‘not at all’) to 5 (‘very much’), with a higher value indicating more influence of that type of information.⁴ To test whether the association between spillover and conflict is different for union and firm negotiators, a dummy variable was created for ‘union negotiator’, where the firm negotiators represented the reference category.

Spillover scales. The limited sample size necessitated parsimonious multivariate models. Seeking a meaningful reduction of the number of independent variables, a principal component analysis was performed⁵ (Appendix Tables A3 and A4 provide detailed information on the bivariate correlations of the items and the PCA), which produced two components with an Eigenvalue larger than 1. The first component reflected the influence of information about readiness for and success of industrial action in the past of the bargaining unit and within the same sector (for these four items, Cronbach’s $\alpha = 0.89$). The second component showed high loadings on the influence of information about

outcomes, readiness for and success of industrial action in other sectors; and medium loadings for information about past outcomes and outcomes in the same sector (for these five items, Cronbach's $\alpha = 0.76$).

Regression scores for each case on the two components were calculated for subsequent analysis. The substantive interpretation of the first component is straightforward as the items clearly reflect information about conflict potential from proximate sources. The variable measuring these component scores was therefore labelled 'proximate conflict spillover'. For the second component, the interpretation is less straightforward, with items referring primarily to information about other sectors and to a lesser extent to outcomes. The variable measuring its component scores was labelled 'distal and outcome spillover'.

Control variables. Montgomery and Benedict (1989) find that negotiator experience reduces strike incidence (cf. Reder and Neumann, 1980). The analysis therefore controlled for negotiator experience, measured as the number of times a negotiator was previously involved in bargaining for the particular collective agreement for which he or she was selected in the sample.⁶ Bargaining level, the size of bargaining unit and sector specific economic conditions were also controlled for, using a dummy variable indicating sector agreements (with company agreements being the reference category), a variable for (the logarithm of) the number of employees covered by the agreement and a categorical variable distinguishing between the primary, secondary (reference category), tertiary (commercial services) and quaternary⁷ (non-commercial services) sector.

Analyses

Descriptive statistics

Table 2 provides descriptive statistics on the variables. Of the 128 respondents, 44 reported no conflict, while 72 experienced a bargaining impasse. In 12 cases there was industrial action. The past experience of a bargaining unit was the most influential source of spillover, followed by companies in the same sector, whereas information about other sectors was less influential. Furthermore, the reported influence of information about outcomes was generally higher than the influence of information about employees' readiness for industrial action and about the success of industrial action. On the whole, these statistics suggest that negotiators are influenced by information spillover both within and between bargaining units and that this influence is larger when the source of information is more proximate.

Additional analyses (Appendix Table A5) showed that for all nine types of spillover, union negotiators reported more influence than firm negotiators. The differences in the average reported influence was particularly large for information about past readiness for and success of industrial action. Applying a series of independent sample t-tests, it was found that these differences between union and firm negotiators were statistically significant ($p < 0.1$; two-tailed) for all types of spillover except for information about outcomes in the past and in other sectors. The finding that spillovers have more influence on union negotiators than on firm negotiators is consistent with the economic rational learning

Table 2. Descriptive statistics.

	Valid N	Min.	Max.	Mean	Standard deviation
Conflict	128	0.00	2.00	0.75	0.61
Union negotiator (ref. firm negotiator)	128	0	1	0.61	
Negotiator experience	128	0.00	16.00	3.03	3.21
Sector agreement (ref. company agreement)	128	0	1	0.32	
Number of employees covered by collective agreement	128	18	819500	17583.56	75686.22
Outcomes for same collective agreement past	121	1	5	3.95	1.08
Outcomes for collective agreements in other companies, same sector	119	1	5	3.46	1.32
Outcomes for collective agreements, other sectors	115	1	5	3.06	1.16
Past readiness for industrial action	113	1	5	3.37	1.31
Readiness for industrial action in other companies, same sector	116	1	5	2.59	1.34
Readiness for industrial action, other sectors	106	1	5	2.08	1.07
Past success of industrial action	102	1	5	3.46	1.35
Success of industrial action in other companies, same sector	112	1	5	2.72	1.32
Success of industrial action, other sectors	102	1	5	2.12	1.11

Source: 2011 Dutch Negotiator Survey (Lehr, 2011).

perspective, where it is argued to stem from unions' informational disadvantage. It is also consistent with the adaption of the sociological diffusion approach presented in this article, where it is argued that such spillovers are of particular strategic relevance to union negotiators. The following section tests these theories' competing hypotheses about the impact of spillover on conflict.

Exploring the association between spillover and conflict

As a first step towards understanding the connection between spillover and conflict, the extent to which the mean values for the nine measurements of spillover differ between those negotiators who experienced some type of conflict (i.e. an impasse or industrial action), and those who did not, was investigated. (A full report of these bivariate analyses is available from the first author upon request.) The mean value was higher among those who had experienced conflict for all items. Independent sample t-tests revealed that the mean differences were not statistically significant for items relating to outcomes of bargaining. However, the differences between mean values were found to differ significantly with p at least <0.1 (two-tailed) for all items relating to readiness for industrial action and to success of industrial action. These findings point towards a positive asso-

Table 3. Ordered logistic regression estimates of the effects of different types of spillover on the probability of experiencing conflict in collective bargaining (N = 112).

Independent Variables	Model 1		Model 2	
	b	s.e.	b	s.e.
Proximate conflict spillover	0.46*	0.19	0.67**	0.23
Distal spillover	0.09	0.18	0.15	0.19
Negotiator (dummy)				
Firm			Reference	
Union			0.26	0.49
Negotiator experience			0.06	0.05
Agreement (dummy)				
Company			Reference	
Sector			1.03 ^a	0.57
Number of employees covered by collective agreement			-0.01	0.11
Economic sector (dummy)				
Primary			-0.22	0.97
Secondary			Reference	
Tertiary			-0.00	0.48
Quaternary			1.60*	0.78
Wald χ^2	5.79		28.69	
Df	2		9	
McKelvey and Zavoina's pseudo R^2	0.13		0.21	

^aStatistically significant at the 0.1 level (two-tailed);

*at the .05 level

**at the .01 level

***at the .001 level.

Source: 2011 Dutch Negotiator Survey (Lehr, 2011).

ciation between spillover and conflict, in particular in those cases where the informational content of spillover pertains to conflict potential.

Multivariate analyses of spillover and conflict

To control for possibly confounding factors and test the interaction hypothesis, multivariate regression models of the effect of spillover on conflict were estimated. These models are reported in Table 3. The first main independent variable was the 'proximate conflict spillover' scale, referring primarily to the influence of information about the readiness for and success of industrial action in the past and within the same sector. The second main independent variable was the distal and outcome spillover scale, which mainly captured the influence of information about other sectors and about bargaining outcomes.

The dependent variable is ordinal. Likelihood-ratio tests of the proportionality of odds across response categories (Wolfe and Gould, 1998) showed that the parallel regression

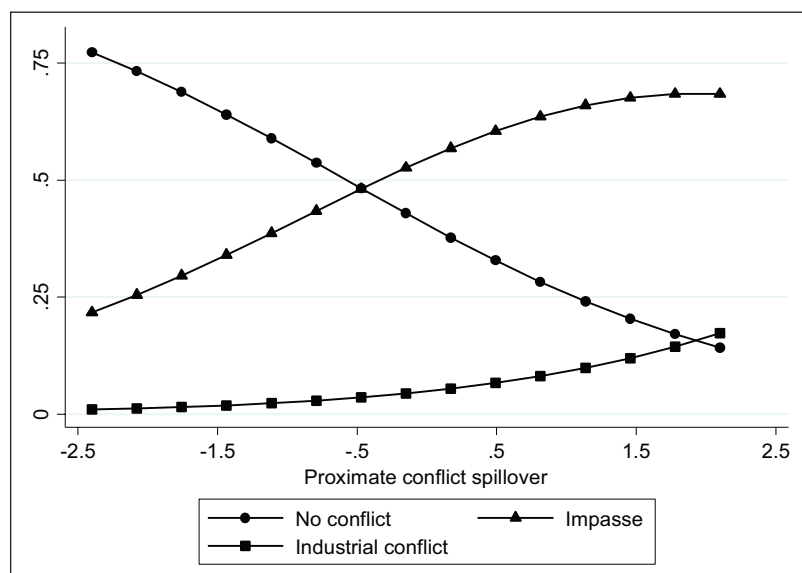


Figure 1. Predicted probabilities for the range of observed scores on the proximate conflict spillover scale.

Source: 2011 Dutch Negotiator Survey (Lehr, 2011).

assumption was not violated. Thus ordinal logistic regression models were fitted. Because in the sample there were negotiators from the same bargaining event, not all observations are independent. Therefore, cluster robust standard errors were estimated. Following Hagle and Mitchell (1992), McKelvey and Zavoina's R^2 was calculated, which may be interpreted as a close approximation of the R^2 one would obtain from fitting an OLS regression to the latent dependent variable representing the probability that the outcomes occur.

Model 1 in Table 3 shows the effects of proximate conflict spillover, as well as distal and outcome spillover on conflict. According to hypothesis 1, spillovers decrease conflict while hypothesis 2a predicts that spillovers related to outcomes increase conflict and hypothesis 2b states that spillover related to conflict potential increase conflict. The findings indicate that if negotiators are more influenced by proximate conflict spillover, they are more likely to experience conflicts ($p=0.016$). An increase from the minimum to the maximum observed value on this scale was associated with a decrease by 0.45 of the predicted probability of no conflict, whereas the probabilities of an impasse and of industrial action increased by 0.27 and 0.18, holding the distal and outcome spillover scale at its mean value. This finding runs against hypothesis 1 and offers support for the competing hypothesis 2b derived from sociological perspectives. Distal and outcome spillover does not significantly affect conflict. This suggests that spillovers predominantly increase conflict if the information refers to conflict potential and sources are sufficiently proximate and that neither the predictions based on rational learning (H1) nor social comparisons (H2a) are supported.

For model 2, the dummy for union negotiator and the control variables negotiator experience, sector agreement, number of employees covered by the contract and economic sector were added. The ordered logit estimate for proximate conflict spillover increased compared to model 1 and was statistically significant at $p = 0.004$. Figure 1 illustrates the predicted probabilities as estimated in this model. For each of the three potential values for conflict, a line is drawn along the predicted probabilities for that value on the y-axis and the observed range of the proximate conflict spillover scale on the x-axis. From left to right, the downward sloping line shows the decreasing probability of no conflict as the scores on proximate conflict spillover increase, while the two upward sloping lines conversely show the increasing probability of impasses and industrial conflict.

To assess the robustness of these findings, the effects of the nine items used to measure spillover were also estimated separately (Appendix Table A6). Overall, the findings were very similar. However, conflict was also found to increase as the reported influence of information about the readiness for industrial action in other sectors increases, suggesting that spillover effects on conflict are not wholly sector specific.

Hypothesis 3 predicts that any effect of spillover on conflict should be greater for union than for firm negotiators. The interaction terms between the union negotiator dummy and the two spillover scales estimated to test this hypothesis, however, consistently failed to reach statistical significance throughout various potential model specifications. For reasons of space, these tests are not presented in Table 3.

Conclusion and discussion

This article has addressed the questions how and under which conditions information about other bargaining events affects conflict in collective bargaining. It offers the first simultaneous investigation of economic, social psychological and sociological approaches to this question. The article has further developed sociological theory to provide new insights into spillover and conflict in contemporary labour relations. Using original data on negotiators in collective bargaining, unique direct measurements of spillover and its impact on conflict were analysed. In this way, effects predicted by the different approaches were critically tested.

No significant effect of spillovers referring to outcomes (e.g. wages) in other bargaining events was found. This suggests that neither the mechanisms described by economic rational learning, nor social comparisons theories by themselves, adequately describe the influence of spillover on conflict. As a caveat to this finding it must be noted that experimental research suggests that either mechanism may be behaviourally plausible depending on specific conditions (Lehr et al., 2013), such that escalating and de-escalating spillovers could leave the average effect indeterminate.

Applying lessons from sociological diffusion theory, it was hypothesized that spillovers carrying information about conflict potential in other bargaining events leads to more conflict. Indeed substantial support for this proposition was found. The more negotiators are influenced by information about workers' readiness for conflict and the potential success of conflict, the more likely it is that they experience conflicts in collective bargaining. Particularly spillovers from the past of the bargaining unit and within the

same sector are associated with increased conflict. The effect thus appears to depend on the proximity of the information source, a pattern presumably related to perceptions of relevance.

Union negotiators are unequivocally influenced more than firm negotiators by information about other bargaining events. However, the relationship between spillover and conflict did not vary significantly between union and firm negotiators, indicating that spillovers can increase the probability of conflict for both types of negotiator. A potential explanation for this finding is that both sides of the bargaining table may opt for conflict and both sides face similar uncertainties about the associated costs and benefits.

Diffusion theories offer valuable insights into labour conflict but must be adapted to account for contemporary labour relations, which are marked by (repeated) collective bargaining and relatively few overt conflicts. Finding weak correlations between observable conflict events may lead to the misleading conclusion that conflict in collective bargaining is not subject to social influences.

This study was constrained by the single-country, cross-sectional sample of modest size and by its reliance on retrospective data. A number of avenues for future research may be suggested. Incorporating questions measuring the influence of spillover in country comparative questionnaire surveys of negotiators could yield important insights into the effects of spillover in different institutional and economic contexts. The collection of matching employer-employee negotiators data offers the possibility to investigate how interactions of spillovers affect bargaining units. Given past challenges to the unitary actor assumption of union negotiators and employees (e.g. Ashenfelter and Johnson, 1969), the addition of matching employee data would allow the impact of their principal-agent relationship to be assessed. Moreover, as causality remains difficult to establish with cross-sectional data and panel data is costly and difficult to gather, studies of collective bargaining using pre- and post-measurements may prove invaluable. Alternatively, experiments offer a useful method to test the behavioural assumptions underlying theories of spillover in a controlled environment. The combination of experimental insights with traditional econometric analyses and the use of qualitative and quantitative data gathered directly from negotiators promises a comprehensive understanding of the effects of spillover in employment relations.

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Notes

1. For instance, prolonging bargaining increases direct costs such as negotiator and staff salaries, overtime payments related to increased production in anticipation of a strike and increasing

- the strike risk and its associated cost itself. Moreover indirect opportunity cost arises from the delayed implementation of improvements to work rules and structure.
2. In Biggs's terminology, the process is referred to as 'positive feedback'.
 3. The favourability of information for negotiators was not quantified for three reasons: first, theoretically, the predicted prevailing effects of spillover on conflict is independent of favourability (see also the designs and findings of Biggs, 2005; Conell and Cohn, 1995; Kuhn and Gu, 1999); second, empirically, such an exercise would entail a selective choice of specific bargaining events on the part of the researcher leading to the problem of a priori limiting of potential reference points; third, the validity of such measurements, i.e. researchers' coding the potential favourability of specific information about specific bargaining events to negotiators in other specific bargaining events, is at best problematic.
 4. Given that some sectors exhibit a mixture of company and sector agreements, spillovers from other companies within the same sector cannot be excluded a priori, even for sector agreements. However, some respondents that were selected for their involvement in sector agreements had missing values for this information source. Their responses were substituted with the lowest possible value, indicating no influence.
 5. The PCA was replicated with different treatments of missing values, i.e. listwise deletion and various imputation models. The extracted components and factor loadings remained reasonably stable and led to substantively similar interpretations throughout. The regression scores used in the multivariate analyses are based on data obtained with a multivariate imputation by chained equations model.
 6. As an alternative, the estimates were also controlled for the impact of negotiator experience, measured as the number of years a respondent had been active as a collective agreement negotiator. This treatment did not alter the findings.
 7. Two of the contracts in the sample were public sector agreements. The robustness of the findings was confirmed by repeating all analyses excluding the corresponding negotiators.

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